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MeIQx binding to human serum albumin and hemoglobin quantified by accelerator mass spectrometry (AMS) following oral administration of low doses of ^{14}C-MeIQx. Dingley, K.H., Freeman, S.P., Leveson, S.H.*, Cupid, B.†, Garner, R.C.† and Turteltaub, K.W. *Lawrence Livermore National Laboratory, Livermore, CA 94551, *York District Hospital, York, YO3 7HE, U.K., †York University, York, YO1 5DD, U.K.*

2-Amino-3,8-dimethylimidazo[4,5-*f*]quinoxaline (MeIQx) is a heterocyclic amine rodent carcinogen present in cooked meats. In order to determine if hemoglobin and serum albumin adducts may be suitable biomarkers of human exposure to MeIQx, seven volunteers scheduled for colon resection surgery were orally administered ^{14}C-MeIQx. Two volunteers received a ^{14}C-MeIQx dose of 228 μg (10 μCi) and 5 volunteers received a dose of 21.3 μg (4.3 μCi). Blood was collected before ^{14}C-MeIQx administration and also 4-6 and 24-30 hours after ^{14}C-MeIQx administration. Albumin and hemoglobin was isolated from the samples and ^{14}C-MeIQx binding measured by AMS. Although MeIQx binding to both hemoglobin and serum albumin demonstrated inter-individual differences, a clear dose-related relationship was observed. Significantly greater MeIQx binding/mole protein occurred to albumin, with approximately 0.01-0.04% and 0.08-0.28% of the total dose binding to hemoglobin and albumin respectively. This binding appeared relatively stable over the 24-30 hour time scale. These results indicate that MeIQx binding to hemoglobin and serum albumin in humans at low-doses is greater than previously predicted and that albumin binding may be a more sensitive marker of exposure than hemoglobin. This work conducted under the auspices of U.S. DOE by LLNL (W-7405-ENG-48) and supported by NIH (CA66861), USAMRDC (MM4559FLB) and the U.K MAFF (FS1722).